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20010002092 Research and Technology Organization, The Human Factors and Medicine Panel, Neuilly-sur-Seine, France
Cognitive Task Analysis *L'Analyse des Taches Cognitives*

October 2000; 53p; In English; The CD-ROM contains full text in PDF format

Report No.(s): RTO-TR-24; AC/323(HFM)TP/16; ISBN 92-837-1045-2; Copyright Waived; Avail: CASI; C01, CD-ROM; A01, Microfiche; A04, Hardcopy

Cognitive task analysis is defined as the extension of traditional task analysis techniques to yield information about the knowledge, thought processes and goal structures that underlie observable task performance. Cognitive task analyses are conducted for a wide variety of purposes, including the design of computer systems to support human work, the development of training, and the development of tests to certify competence. As part of its Programme of Work, NATO Research Study Group 27 on Cognitive Task Analysis has undertaken the task of reviewing existing cognitive task analysis techniques. The Group concludes that few integrated methods exist, that little attention is being paid to the conditions under which methods are appropriate, and that often it is unclear how the products of cognitive task analysis should be used. RSG.27 has also organized a workshop with experts in the field of cognitive task analysis. The most important issues that were discussed during the workshop were: (1) the use of CTA in the design of new systems, (2) the question when to use what technique, and (3) the role of CTA in system design. RSG.27 emphasizes: (1) that is important for the CTA community to be able to empirically demonstrate the added value of a CTA; (2) it is critical for the success of CTA to be involved in the design process from the start to finish, and to establish clear links with methods that are used by other disciplines; and (3) recommends that more research effort be directed to the issue of the reliability of CTA techniques.

Author

Cognition; Mental Performance; Human Factors Engineering; Human-Computer Interface; Command and Control; Education; Tasks

20010002094 Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
RTO Educational Notes: EN-1, EN-2, EN-3, EN-4, EN-6, and EN-7

September 1998; In English; RTO Educational Notes, 14-15 Sep. 1998, Lyon, Cologne, Cleveland, OH, France, Germany, USA; The CD-ROM contains full text document in PDF format

Report No.(s): RTO EN-1; RTO EN-2; RTO EN-3; RTO EN-4; RTO EN-6; RTO EN-7; AC/323(AVT)TP/1; AC/323(SET)TP/1; AC/323(HFM)TP/1; AC/323(AVT)TP/6; ISBN 92-837-1000-2; Copyright Waived; Avail: CASI; C01, CD-ROM

The material in this publication was assembled to support a Lecture Series under the sponsorship of the Applied Vehicle Technology Panel and the Consultant and Exchange Programme of RTO presented on 14-15 September 1998 in Lyon, France, on 17-18 September 1998 in Cologne, Germany, and on 22-23 September 1998 in Cleveland, USA. It covers the following

technological areas: EN-1, integrated design of high pressure performance multistage compressor systems; EN-2, advance pattern recognition techniques; EN-3, alternative control technologies-human factors issues; EN-4, fluid dynamics research on supersonic aircraft; EN-6, planar optical measurement methods for gas turbine components; and EN-7, application of mathematical signal processing techniques to mission systems.

CASI

Lectures; Turbocompressors; Pattern Recognition; Control Systems Design; Fluid Dynamics; Signal Processing; Optical Measurement; Design Analysis; Engine Design; Engine Parts

20010002522 Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France

The Capability of Virtual Reality to Meet Military Requirements *La Capacité de la Réalité Virtuelle à Répondre Aux Besoins Militaires*

November 2000; 174p; In English, 5-9 Dec. 1997, Orlando, FL, USA; See also 20010002523 through 20010002547; The CD-ROM contains full text document in PDF format

Report No.(s): RTO-MP-54; AC/323(HFM)TP/24; ISBN 92-837-1046-0; Copyright Waived; Avail: CASI; A08, Hardcopy; A02, Microfiche; C01, CD-ROM

The purpose of the workshop was to examine military requirements for Virtual Reality technology, consider human factors issues in the use of Virtual Reality and review recent research in development of Virtual Reality applications to meet military needs. The workshop was organized into three day long sessions. The first day focused on military applications for Virtual Reality systems and identified particular requirements for Human Factors research to meet the requirements. The second day examined Human Factors issues in the use of Virtual Reality technology. Presentations discussed sensory interfaces, measures of effectiveness, importance of the sensation of presence, and cybersickness. The third day reviewed assessment methods and applications research. Speakers reviewed existing or completed Virtual Reality projects designed to meet military needs. The papers discussed how the projects overcame human factors problems and how their effectiveness was evaluated. Virtual Reality technology is of great interest to the military. Requirements for its use encompass a wide range of applications including concept development of systems for dismounted combatants, mission rehearsal for special operations, training ship handling skills, telerobotics, and practicing military medical procedures. Virtual Reality's success in meeting these needs will be determined by the ability of its human-computer interfaces to provide the means necessary to deliver stimuli and allow appropriate responses from those using it. These human factors issues were the focus of the workshop. The workshop pointed to areas that require further research and development in order for Virtual Reality to meet its potential for the military.

Author

Human Factors Engineering; Human-Computer Interface; Virtual Reality; Computerized Simulation; Motion Simulation

20010002548 Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France

Aging Engines, Avionics, Subsystems and Helicopters *Moteurs, Avionique, Sous-Systemes et Helicopteres de Generations Precedentes*

Aging Engines, Avionics, Subsystems and Helicopters; October 2000; 119p; In English, 23-24 Oct. 2000, Atlantic City, Madrid, USA, Spain; See also 20010002549 through 20010002554; CD-ROM contains full text document in pdf format

Report No.(s): RTO-EN-14; AC/323(AVT)TP/32; RTO-LS-218; ISBN 92-837-1051-7; Copyright Waived; Avail: CASI; A06, Hardcopy; A02, Microfiche; C01, CD-ROM

Aging Aircraft concerns have dramatically escalated in the military community and commercial aviation during the past decade. Some models, which have already been in service for more than 40 years, will need to be retained for another two decades or longer, often serving in roles and in theaters very different from what was envisioned when they were originally designed. Aging Aircraft has several connotations. to name a few: (1) technological obsolescence, (2) the spectre of runaway maintenance costs, and (3) safety. Moreover, spare parts, processes, and tooling may no longer be available, logistic procedures may have changed and suppliers may be out of the business. Budgetary limitations and higher fleet utilization will increase the demand to cope with aging structures and major subsystems like engines and avionics. Specific topics covered by this Lecture Series are: (1) An operator's perspective on aging engines; (2) Modern engine modernization programs; (3) Aging electrical systems and wiring; (4) Aging avionics; (5) Aging helicopter-related issues; (6) Other subsystems; and (7) Safety and service difficulty reporting.

Author

Conferences; Avionics; Costs; Aircraft Maintenance; Aircraft Safety; Aging (Materials); Aircraft Reliability; Damage Assessment

20010003245 Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France
Usability of Information in Battle Management Operations *L'Exploitation de L'Information dans les Operations de Gestion du Champ de Bataille*

Usability of Information in Battle Management Operations; November 2000; 234p; In English, 10-13 Apr. 2000, Oslo, Norway; See also 20010003246 through 20010003267; CD-ROM contains full text document in pdf format

Report No.(s): RTO-MP-57; AC/323(HFM)TP/29; ISBN 92-837-0017-1; Copyright Waived; Avail: CASI; A11, Hardcopy; A03, Microfiche; C01, CD-ROM

On 10-13 April 2000, NATO, Partnership for Peace, and Non-NATO nationals from 21 countries met in Oslo, Norway to discuss the perceptual, cognitive, social, and contextual factors and considerations that will impact the usefulness and usability of information and information technologies in battle management operations. Sponsored by the Human Factors and Medicine Panel of the North Atlantic Treaty Organization's Research and Technology Organization, the symposium participants discussed the problem, research approaches and techniques for improving team performance and enhancing effectiveness, concepts for battlespace visualization and decision support, and the integration of collaborative battle management systems. The symposium included four Keynote Addresses and sessions on: (1) Operational Problems in Battlespace Management; (2) Team Performance; (3) Techniques for Enhancing Battlespace; (4) Visualization and Decision Support; (5) Decision Support Considerations; and (6) Integration and Test of Battle Management Systems.

Author

Conferences; Management Systems; Operational Problems; Teams; Social Factors; Information Systems; Command and Control; Military Technology

20010004090 Research and Technology Organization, Neuilly-sur-Seine, France

RTO Meeting Proceedings: MP-15, MP-16, MP-17, MP-18, MP-19, MP-20, MP-21, MP-26, MP-38, MP-43

[1999]; In English; Fluid Dynamics Problems of Vehicles Operating Near or in the Air-Sea Interface, 5-8 Oct. 1998, Amsterdam, Chester, Corfu, Corfu, San Diego, CA, Wright-Patterson AFB, OH, San Diego, CA, Lillehammer, Issy-les-Moulineaux, Saint Petersburg, Netherlands, UK, Greece, Greece, USA, USA, USA, Norway, France, Russia; The CD-ROM contains full text document in PDF format

Report No.(s): RTO-MP-15; RTO-MP-16; RTO-MP-17; RTO-MP-18; RTO-MP-19; RTO-MP-20; RTO-MP-21; RTO-MP-26; RTO-MP-38; RTO-MP-43; ISBN 92-837-0004-X; Copyright Waived; Avail: CASI; C01, CD-ROM

This report containing the Meeting Proceedings Published during 1998 - 1999 years. The papers discusses the following: Fluid dynamics problems of vehicles operating near or in the air-sea interface (MP-15). Aircraft weapon system compatibility and integration (MP-16). Qualification of life extension schemes for engine components (MP-17). Fatigue in the presence of corrosion (MP-18). Current aeromedical issues in rotary wing operations (MP-19). Models for aircrew safety assessment: uses, limitations and requirements (MP_20). Aeromedical aspects of aircrew training (MP-21). Technical mobile communications (MP-26). Modeling and analysis of command and control (MP-38). 6th Saint Petersburg International Conference of integrated navigation systems (MP-43).

CASI

Conferences; Aerospace Medicine; Engine Parts; Fluid Dynamics; Mobile Communication Systems; Navigation; Safety; Weapon Systems

20010004091 Research and Technology Organization, Neuilly-sur-Seine, France

RTO Meeting Proceedings: MP-7, MP-8, MP-9, MP-10, MP-11, MP-12, MP-13, and MP-14

[1999]; In English; Exploitation of Structural Loads/Health Data for Reduced Life Cycle Costs, 11-12 May 1998, Brussels, Toulouse, Brussels, Brussels, Madrid, Ottawa, Ontario, Aalborg, Lisbon, Belgium, France, Belgium, Belgium, Spain, Canada, Denmark, Portugal; CD-ROM contains full text document in pdf format

Report No.(s): RTO-MP-7; RTO-MP-8; RTO-MP-9; RTO-MP-10; RTO-MP-11; RTO-MP-12; RTO-MP-13; RTO-MP-14; ISBN 92-837-1005-3; Copyright Waived; Avail: CASI; C01, CD-ROM

The total spectrum of R & T activities is covered by 6 Panels, dealing with: SAS Studies, Analysis and Simulation; SCI Systems Concepts and Integration; SET Sensors and Electronics Technology; IST Information Systems Technology; AVT Applied Vehicle Technology; and HFM Human Factors and Medicine. These Panels are made up of national representatives as well as generally recognized 'world class' scientists. The Panels also provided a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with

a specific duration. Such Technical Teams can organize workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

Derived from text

North Atlantic Treaty Organization (NATO); Research and Development; Research; Technologies; Conferences

20010004092 Research and Technology Organization, Neuilly-sur-Seine, France

RTO Meeting Proceedings: MP-1, MP-3, MP-4, MP-5, MP-6

[1998]; In English; E-O Propagation, Signature and System Performance Under Adverse Meteorological Conditions Considering Out-of-Area Operations, 16-19 Mar. 1998, Naples, Monterey, CA, Edinburgh, Sorrento, Mannheim, Italy, USA, UK, Italy, Germany; CD-ROM contains full text document in PDF format

Report No.(s): RTO-MP-1; RTO-MP-3; RTO-MP-4; RTO-MP-5; RTO-MP-6; ISBN 92-837-0001-5; Copyright Waived; Avail: CASI; C01, CD-ROM

The total spectrum of R & T activities is covered by 6 Panels, dealing with: SAS Studies, Analysis and Simulation; SCI Systems Concepts and Integration; SET Sensors and Electronics Technology; IST Information Systems Technology; AVT Applied Vehicle Technology; and HFM Human Factors and Medicine. These Panels are made up of national representatives as well as generally recognized 'world class' scientists. The Panels also provided a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with a specific duration. Such Technical Teams can organize workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

Derived from text

North Atlantic Treaty Organization (NATO); Research and Development; Research; Technologies

20010004800 Research and Technology Organization, Neuilly-sur-Seine, France

RTO Technical Reports: TR-4, TR-7, TR-8, TR-27

[1999]; In English; The CD-ROM contains full text document in PDF format

Report No.(s): RTO-TR-4; RTO-TR-7; RTO-TR-8; RTO-TR-27; ISBN 92-837-1013-4; Copyright Waived; Avail: CASI; C01, CD-ROM

This NATO Research and Technology Organization CD-ROM publication contains 4 technical reports entitled: 1) Cervical Spinal Injury from Repeated Exposures to Sustained Acceleration; 2) Alternative Control Technologies; 3) Land Operations in the Year 2020 (LO2020); and 4) A Feasibility Study for Collaborative Multi-facility Windtunnel Testing for CFD Validation.

CASI

Back Injuries; Acceleration Tolerance; Spacecraft Control; Human Factors Engineering; Military Technology; Wind Tunnel Tests; Computational Fluid Dynamics

20010009801 Research and Technology Organization, Sensors and Electronics Technology Panel, Neuilly-sur-Seine, France

Low Grazing Angle Clutter: Its Characterization, Measurement and Application *Le Fouillis a Incidence Rasante, Caracterisation, Mesure et Application*

October 2000; 387p; In English; In French, 25-27 Apr. 2000, Laurel, MD, USA; See also 20010009802 through 20010009838; Original contains color illustrations

Report No.(s): RTO-MP-60; AC/323(SET)TP/12; Copyright Waived; Avail: CASI; A17, Hardcopy; A04, Microfiche; C01, CD-ROM

This publication contains the papers presented at a symposium sponsored by the Sensors and Electronics Technology Panel of the RTO. The purpose of the symposium was to bring together theoreticians, modelers, experimenters, and radar system engineers together to assess the state of present capabilities and needs in the area of low grazing angle clutter characterization, measurement, modeling, and understanding in order to aid the radar designer to extend the functional range of both old and new radars. The symposium was structured into three sections: Experimental observations. Theory-numerical studies and Modeling/simulation. The following topics were covered: (1)the measurement of low grazing angle (LGA) monostatic and bistatic radar clutter (RC); (2) theoretical models of LGA clutter; (3) numerical computation of LGA electromagnetic scattering from rough surfaces (clutter) for both fixed and moving surfaces; (4) remote sensing of surface features and target manifestations using LGARC; (5) the impact of surface roughness and/or vegetation on LGARC (6) fading predictions for LGARC and (7) clutter impact on radar signal processing design.

Author

Clutter; Electromagnetic Scattering; Mathematical Models; Signal Processing; Surface Roughness

20010009839 Research and Technology Organization, Applied Vehicle Technology Panel, Neuilly-sur-Seine, France
Verification and Validation Data for Computational Unsteady Aerodynamics *Donnees de Verification et de Validation Pour l'Aerodynamique Instationnaire numerique*

Verification and Validation Data for Computational Unsteady Aerodynamics; October 2000; 567p; In English; See also 20010009840 through 20010009865; CD-ROM contains full text document in pdf format

Report No.(s): RTO-TR-26; AC/323(AVT)TP/19; ISBN 92-837-1048-7; Copyright Waived; Avail: CASI; A24, Hardcopy; A04, Microfiche; C01, CD-ROM

Computational Unsteady Aerodynamics computer codes are being increasingly used. In order to validate their results they must be tested against valid experimental data. The present report aims at collecting reliable experimental data on unsteady aerodynamics and presenting them in a form which permits use for verification of codes. For ease of handling, the data are also presented in machine readable form (CD-ROM). Data on increasingly complex generic forms were selected and the following categories are covered: flutter, buffet, stability and control, dynamic stall, cavity flows, store separation. Computational solutions are included in order to permit evaluation of codes and analysis of solutions which differ from experimental data.

Author

Unsteady Aerodynamics; Computer Programs; Computation; Data Acquisition

20010012824 Research and Technology Organization, Sensors and Electronics Technology Panel, Neuilly-sur-Seine, France
Space-Based Observation Technology *Les Technologies de l'observation Spatiale*

October 2000; 245p; In English; Space-Based Observation Technology, 16-18 Oct. 2000, Samos, Greece; See also 20010012825 through 20010012851; CD-ROM contains full text document in PDF format

Report No.(s): RTO-MP-61; AC/323(SET)TP/14; ISBN 92-837-1050-9; Copyright Waived; Avail: CASI; A11, Hardcopy; A03, Microfiche; C01, CD-ROM

Observation of the earth by use of spacebased sensors has a large number of advantages compared with ground-based or airborne sensors. It is, therefore, a primary requirement of future reconnaissance systems, and is thus also a primary requirement of future reconnaissance systems of NATO. There is a tendency worldwide to place in space many reconnaissance functions that have so far been fulfilled by airborne systems. Spaceborne sensors are in essence optical and radar sensors. Optics have the property of high geometric resolution, but fail during the night and under adverse weather conditions. Radar can penetrate weather, dust and even foliage. The resolution achieved nowadays with Synthetic Aperture Radar (SAR) technology comes close to that of optical resolution. SAR offers additional features such as classification based on Doppler or polarimetry, moving target detection, 3D-imaging etc. Sensors installed on a spacecraft have to fulfill various conditions which have to do with the space environment. Light weight, low-power power consumption, small size are prerequisites. Moreover, components have to be space-proof. Signal and image processing techniques and technology for on-board real-time processing have to be considered as well. Starting from operational requirements this symposium summarizes aspects of spaceborne radar, including the required technology as well as special features, signal and data processing, optronics instrumentation and detector technology, so as to cover the whole range of spacebased observation technology based on radar and optronics. Various existing or planned observation satellite projects are described.

Author

Conferences; Spaceborne Lasers; Electro-Optics; Radar Detection; Target Acquisition; Target Recognition; Artificial Satellites; Synthetic Aperture Radar; Space Based Radar; Remote Sensing

20010016868 Research and Technology Organization, Human Factors and Medicine Panel, Neuilly-sur-Seine, France
The Human Factor in System Reliability: Is Human Performance Predictable? *Les Facteurs Humains et la Fiabilite des Systemes: Les Performances Humaines, Sout-Elles Previsibles?*

January 2001; 110p; In English, 1-2 Dec. 1999, Siena, Italy; See also 20010016869 through 20010016875; Original contains color illustrations

Report No.(s): RTO-MP-032; AC/323(HFM)TP/12; ISBN 92-837-1053-3; Copyright Waived; Avail: CASI; A06, Hardcopy; A02, Microfiche; C01, CD-ROM

Human error is seen as an unacceptably high contributing factor in most military accidents and much research has been carried out over the past 50 years, to attempt to predict the probability of the occurrence of human error. Significant advances have been made within the safety critical domain areas within the nuclear and chemical industries. The aim of the workshop was to review the research carried out across multiple domain areas in order to provide a clear focus for Working Group 30 (Human Reliability in Safety Critical Systems). It was evident from the workshop that key cognitive processes and organizational contexts play an important part in shaping the overall human performance and hence the likelihood of human error. Therefore it was clear that there are new approaches to Human Reliability Assessment that take account of the unique human adaptability attributes that are not

present in any other part of the overall system in which the human is an integral part. Working Group 30 will develop these approaches to provide clear guidance to the NATO community in designing and analysing human roles to quantify and qualify the likelihood of error. This will enhance future design processes to produce higher fault tolerant designs, to include mitigating strategies and aim towards a significant reduction in the number of human errors.

Author

Human Performance; Reliability; Safety; Systems Analysis; Human Behavior; Conferences

20010018863 Research and Technology Organization, Systems, Concepts and Integration Panel, Neuilly-sur-Seine, France

Flight Control Design: Best Practices *La Conception des Systemes de Commande de Vol: Les Meilleures Pratiques*

December 2000; 214p; In English; Original contains color illustrations

Report No.(s): RTO-TR-029; AC/323(SCI)TP/23; ISBN 92-837-1047-9; Copyright Waived; Avail: CASI; A10, Hardcopy; A03, Microfiche; C01, CD-ROM

Accidents due to adverse aircraft-pilot coupling phenomena in the latest technology aircraft occurred both in the US and in Europe, while other programs had less-well-publicized flight control development problems. These events showed that a robust and affordable solution to the development process of digital flight control systems was not universally available. This Technical Report begins with a review of some examples of flight control problems. They span the history of flight from the time when the practice of flying was preceding theoretical developments up to the recent events. There is a chapter detailing lessons learned from various programs with positive results. The review of problems and lessons learned leads into a chapter detailing a series of recommended design best practices. The best practices are laid out as a logical process with recommendations for avoiding the pitfalls that have led to problems in the past. The second part of the report continues with some theoretical aspects, such as flying qualities criteria and "carefree handling", the latest results from analytical and research activities into PIOs, and modelling and system identification to support the design process. The report concludes with suggestions for required future research.

Author

Flight Control; Control Systems Design; Pilot Induced Oscillation; Aircraft Control; Pilot Error

20010019317 Research and Technology Organization, Information Systems Technology Panel, Neuilly-sur-Seine, France

Commercial Off-the-Shelf Products in Defence Applications "The Ruthless Pursuit of COTS" *l'Utilisation des Produits Vendus sur Etageres dans les Applications Militaires de Defense "l'Exploitation Sans Merci des Produits Commerciaux"*

Commercial Off-the-Shelf Products in Defence Applications 'The Ruthless Pursuit of COTS'; December 2000; 214p; In English; Commercial Off-the-Shelf Products in Defence Applications "The Ruthless Pursuit of COTS", 3-5 Apr. 2000, Brussels, Belgium; See also 20010019318 through 20010019341; CD-ROM contains full text document in PDF format

Report No.(s): RTO-MP-48; AC/323(IST)TP/7; ISBN 92-837-1049-5; Copyright Waived; Avail: CASI; A10, Hardcopy; A03, Microfiche; C01, CD-ROM

This volume contains 24 unlimited papers and 2 Keynote Addresses presented at the Information Systems Technology Panel Symposium held in Brussels, Belgium, 3-5 April 2000. The papers were presented under the following headings: (1) Academic Perspective: Commercial Off-the-Shelf Products (COTS) Acquisition, Utilization, and Evaluation; (2) COTS Acquisition Challenges; (3) COTS: Evaluation and Assurance; (4) Vendor Perspective: COTS; (5) User Perspective: COTS; and (6) COTS: Integration

Author

Conferences; Information Systems; Commercialization; Product Development